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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,428	07/27/2001	Charles C. Haluzak	10008368-1	1124

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EXAMINER

CREPEAU, JONATHAN

ART UNIT PAPER NUMBER

1746

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/917,428

Applicant(s)

HALUZAK, CHARLES C.

Examiner

Jonathan S. Crepeau

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-17. Applicant's argument regarding the §102 rejection is deemed persuasive and the rejection is withdrawn. However, the claims are newly rejected under 35 USC §103 herein. As such, this action is non-final.

Claim Rejections - 35 USC § 103

2. Claims 1-10 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jankowski et al (U.S. Pre-Grant Publication No. 2003/0138685).

Regarding claims 1 and 14, the reference is directed to a miniaturized thin-film fuel cell (see abstract). As shown in Figure 8 and described in paragraph 43, the fuel cell comprises a manifold structure constructed from a first substrate (upper plate 211') having a face surface and a fuel chamber (220) defined therein for receiving the fuel, the fuel chamber further having an opening along the face surface. A first anode-electrolyte-cathode assembly (213) is secured to the top face surface of the substrate and hydraulically seals the fuel chamber from the oxidant chamber. Regarding claim 4, the substrate may comprise a plurality of fuel chambers (see paragraph 43). Regarding claims 7 and 16, the fuel cell further comprises a second manifold structure constructed from a second substrate (lower plate 211') and a second anode-electrolyte-cathode assembly (213) secured to the bottom face of the second substrate (see Fig. 8).

Regarding claims 8 and 16, the first and second manifold structures are spaced apart from each

other and are operably secured within a frame (216) to define first and second oxygen containing regions within the frame. Regarding claims 9 and 13, the first and second substrates are bonded together, the back surfaces of the substrates allowing the respective fuel chambers to be in fluid communication with each other. Regarding claims 10, 15, and 17, a plurality of the fuel cells may be stacked, either within the same frame (i.e., horizontally) or along frames that are placed adjacent to each other (i.e., vertically) (see paragraph 43). Regarding claims 2 and 3, the substrate is a silicon wafer (see paragraphs 27 and 28). Regarding claims 5 and 14, the fuel cell is a proton exchange membrane fuel cell (see paragraphs 26 and 35). Regarding claim 6, the electrolyte may have a thickness of 0.5-50 microns (see paragraph 41).

It is noted that the claimed apparatus and the prior art apparatus are identical except for the elongate shape of the fuel chambers and associated fuel cells. However, such changes in shape are generally considered to be a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed apparatus is significant. See MPEP §2144.04(IV). In his remarks, the Applicant asserts that the amount of electricity produced can be optimized by increasing the surface area of contact between the fuel and adjacent electrode. However, the concept of increasing the surface area of an electrode to increase current output is well-known in the art and is not considered to represent an inventive step or an unexpected result. As such, the claimed subject matter is still not considered to be distinguished over Jankowski.

3. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jankowski et al. as applied to claims 1-10 and 13-17 above, and further in view of Washington et al (U.S. Patent 5,300,370).

Jankowski et al. do not expressly teach that the plurality of channels, i.e., fuel chambers, are in fluid communication with each other in a parallel or serpentine configuration, as recited in claims 11 and 12.

Washington et al. is directed to a flow field assembly for a fuel cell. In column 13, line 45, the reference teaches that its flow field assemblies can be formed with continuous, serpentine flow channels.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the serpentine channel configuration of Washington et al. in the fuel cell of Jankowski et al. In column 3, line 12, Washington et al. teach that “[t]he continuous channel design promotes the forced movement of water through each channel before the water can coalesce, thereby promoting uniform reactant flow across the surface of the cathode.” Accordingly, the artisan would be motivated to use the serpentine channel configuration of Washington et al. in the fuel cell of Jankowski et al.

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Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau
Patent Examiner
Art Unit 1746
June 29, 2004